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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/782,670   | 02/19/2004  | Chang-Ming Dai       | TS01-1582E          | 5242             |
| 7590   | 03/20/2006  |                      | EXAMINER            |                  |
| George O. Saile<br>28 Davis Avenue<br>Poughkeepsie, NY 12603 |             |                      | DINH, PAUL          |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2825                |                  |
| DATE MAILED: 03/20/2006                                      |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/782,670

Applicant(s)

DAI ET AL.

Examiner

Paul Dinh

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 32-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 32-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

*Paul Dinh*

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/29/04
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This is a response to the preliminary amendment filed on 3/29/04.

Claims 32-45 are pending.

#### ***Claim Rejections - 35 USC § 112***

*The following is a quotation of the second paragraph of 35 U.S.C. 112:*

*The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.*

Claims 32-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 32 is rejected because “the resulting pattern” and “the lithography process” lack antecedent basis.

Claims 33-45 are rejected because they depend on claim 32.

#### ***Claim Rejections - 35 USC § 102***

*The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:*

*A person shall be entitled to a patent unless –*

*(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.*

Claims 32-36 are rejected under 35 U.S.C. 102(e) as being anticipated by the prior art of record Smith (US pub. 2002/0186356)

(Claim 32) A method of forming a feature on a substrate that includes a first exposure with an APSM with full size scattering bars (fig 5-10, 14-15, para 0062) and a second exposure

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with a tritone attenuated mask having at least one scattering bar (para. 0059-0060, 0070), said scattering bars are not printed in the resulting pattern from the lithography process (para 0058, 0060, 0062, 0076, 0013, 0020, 0052).

(Claim 33) wherein said first exposure is comprised of patternwise exposing a positive tone photoresist layer on said substrate through said alternating phase shift mask with scattering bars using radiation comprised of one or more wavelengths from about 150 nm to 600 nm (para 0023, 0035, 0049, 0064, 0067)

(Claim 34) further comprised of a single development step, which follows the second exposure (fig 1-20, para 0006, 0088, 0077).

(Claim 35) wherein the resulting pattern is comprised of line widths that are between 1/4 and 1/2 of the exposing wavelength in size (para 0059, 0064).

(Claim 36) wherein said APSM is comprised of phase shift regions having a phase width that are separated by chrome regions (para 0068, 0072-0074).

Claims 32 rejected under 35 U.S.C. 102(e) as being anticipated by the prior art of record Peterson (US pub. 2002/0015900)

(Claim 32) A method of forming a feature on a substrate that includes a first exposure with an APSM with full size scattering bars and a second exposure with a tritone attenuated mask having at least one scattering bar, said scattering bars are not printed in the resulting pattern from the lithography process (fig 3, 7-9, para 0024).

Claims 32 rejected under 35 U.S.C. 102(e) as being anticipated by the prior art of record Pedik et al (USP 6673638)

(Claim 32) A method of forming a feature on a substrate that includes a first exposure with an APSM with full size scattering bars and a second exposure with a tritone attenuated mask having at least one scattering bar, said scattering bars are not printed in the resulting pattern from the lithography process (fig 1-2, 7-8, col 1 line 60+, col 4 line 58+).

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***Allowable Subject Matter***

Claim 37-45 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claim 37-45 would be allowable because the prior art of record does not teach or suggest the limitations:

(In claim 37) “wherein said chrome regions are comprised of chrome lines that are used to define shrunken gates in said resulting pattern and full size scattering bars wherein from one to three scattering bars are positioned between each chrome line”

(In claim 41) “wherein the tritone attenuated mask is comprised of a transparent region, an attenuated phase shift region, and a chrome block region that protects a shrunken gate formed by said first exposure”

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Dinh whose telephone number is 571-272-1890. If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Jack Chiang can be reached on 571-272-7483. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul Dinh  
Primary Examiner

A handwritten signature in black ink that reads "Paul Dinh". The signature is written in a cursive style with a long, sweeping line extending from the end of the name.